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MICHAEL R. KELLEY, PH.D.

• Shannondale Wireless–Microwave Television
WHT 629, WLK 242, Shannondale, West Virginia
WNEY 445, Bethesda, Maryland (Washington, D.C.)

• Radio–T.V. Telecommunications Consulting
• Blue Ridge Radio Towers, Inc.

• Publishing – Recording
Mike Kelley Music, B.M.I.
Freeland Recording Company, Vice President

September 27, 1995

Mr. William F. Caton
Acting Secretary
The Federal Communications Commission
1919 M Street, N.W.
Washington, D.C., 20554

Dear Mr. Secretary:

Enclosed are an original plus four copies of my comments in the Third Notice of Proposed Rulemaking (PR Docket 89-552) regarding Amendments to Part 90 of the Commissions Rules to provide for the Use of the 220-222 MHz Band by the Private Land Mobile Radio Service.

If there are any questions about this submission, please direct them to the undersigned.

Respectfully submitted.

Michael R. Kelley, Ph.D.
d/b/a Shannondale Wireless

Enclosures

3623 PARKLANE ROAD • FAIRFAX, VIRGINIA 22030 • PHONE: (VOICE) 703.691.1119 (FAX) 703.691.8938

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	PR Docket No. 89-552
Amendment to Part 90 of the Commission's Rules To Provide for the Use of the 220-222 MHz Band by the Private Radio Service	)	RM-8506
	)	GEN Docket No.93-252

COMMENTS OF
MICHAEL R. KELLEY

Michael R. Kelley, d/b/a Shannondale Wireless, is the licensee of stations WPCV 414 (a Q0 Station) and WPCX 590 (a QD Station) in the 220 MHz service. These two single channel stations have been operational since June, 1994. Kelley is a member of The American Mobile Telecommunications Association (AMTA) and supports its comments in the above matter. But Kelley wishes to make comments specific to his own experience operating at 220 MHz, and to comment on incumbent protection issues which AMTA does not address.

I

Kelley strongly supports the Commission's opinion "that it remains unnecessary for us to provide a permanent allocation exclusively for data and digital operations," and the Commission's proposal in the same section to "eliminate the current "data-only" channel allocation in Phase II . . . . [And] propose that Phase I licensees . . . be permitted to construct non-"data only" systems if they so choose." (3rd NPRM, Pgs. 28-29, Para. 52). A brief history of Kelley's stations is illustrative.

Kelley originally built the stations using Uniden equipment which had no data interface capability when he purchased it in May of 1994. Uniden promised data capability "sometime in the future" but had so many other problems with its narrowband repeaters and mobile radios that it finally suspended activity in this band, and gave Kelley a full refund upon return of the base stations and mobile equipment. Uniden never developed a data interface.

Before returning the Uniden equipment, Kelley purchased two repeaters from SEA in May of 1995. SEA also has no data interface capability on its conventional repeaters or mobile radios. The SEA repeaters do have a rear panel serial accessory connection for voice or data interface, but that connection port is only active when the repeater is placed in trunked mode. But the repeater will only operate in this mode when connected to an expensive external trunking controller. QD channels are, of course, not permitted to be operated in a trunked mode, so the accessory connector is of no

use. Neither SEA nor Uniden provide data interface connections of any kind on their mobile radios, and there are no type-approved data terminals with built-in 220 MHz transceivers on the market.

The current lack of data interface equipment is not the only or even the main reason why Kelley supports the Commission's proposal to end the "data-only" reservation. It can truly be said that type-approved voice transmission equipment in the 220 MHz service is already at the cutting edge "test bed" stage that the Commission envisioned for the "data-only" channels. Repeaters and mobiles in the 220 MHz service are essentially computers with an RF component on board. The pilot tone, the data identifiers, the customized user codes that the mobiles and the repeaters constantly transmit to one another, and the way that the single sideband signal is digitally processed before being transmitted in the 5 KHz bandwidth, turn every voice transmission into a virtual "data stream." In 220 MHz narrowband single sideband, voice is simply another kind of data, and the Commission has now already achieved what it initially wanted when it established a narrowband service at 220 MHz. To continue a "data-only" set aside for further technology development at this point would be overkill.

Finally, and perhaps most importantly, the "data-only" set aside assumes the existence of a marketplace for data applications. Unfortunately, evidence in the marketplace speaks volumes that this is not the case. In the October 2, 1995 issue of Business Week, an article about the AT&T breakup explains that CEO Robert Allen concluded that "the concept of converging communications and computer markets . . . is an illusion" (Pg. 56). According to an article in the August 28, 1995 issue of Inter@ctive Week, Motorola reportedly has laid off 20% of its wireless data group staff earlier that month "apparently because the market for data applications is still relatively moribund" (Pg. 27). An article in the July 24, 1995 issue of RCR about the cellular industry (which is far more robust than 220 MHz), begins with the statement: "While voice transmissions over the cellular network have reached a certain degree of maturity in the marketplace, data transmissions continue to alternately attract and frustrate carriers, manufacturers, and end users" (Pg. 28).

Another Business Week article dated June 26, 1995 is entitled "Wireless Data: Still Trapped in the Ozone: It must overcome glitches, cost, and cultural resistance" (Pg. 106). The February 6, 1995 edition of Broadcasting reports, "TV has tough time turning data into dollars. Few stations have found a market for digital services" (Pg. 37).

In the classic "chicken-egg" model, wireless data is even a slow growing part of the cellular industry because there is a lack of easy applications hardware and software and inexpensive service. The equipment and affordable pricing for the service have not developed due to a lack of strong marketplace demand. The 220 MHz

industry is so much lower on the food chain than cellular or even 800 and 900 MHz SMR and ESMR. Five kHz channels are so restricted in the amount of data throughput they can accommodate (2400 baud vs. 14,400 or even 28,800 for cellular) that those few applications which become available will present real engineering challenges for the 220 MHz industry to overcome. When (if) the market for mobile wireless data finally arrives, and interface equipment is available, there will be data on 220 MHz channels as well as many other channels across the RF land-mobile spectrum without any encouragement or mandate from the Commission.

For all of the above reasons, and most importantly so that services can be provided to the public in response to both the public need and marketplace demand, Kelley strongly supports the Commission's proposal that all Phase I and Phase II licensees authorized on Channels 186-200 be permitted to construct non-"data only" systems if they so choose.

II

For many of the same reasons cited about the uniqueness of the 220 MHz service, its immense spectral efficiency, and its need to find a niche among competitors with far more spectrum, Kelley strongly supports the Commission's proposal for Phase I and Phase II licenses (Pg. 40, Para. 77) ". . .to lift current restrictions on primary fixed use, in order to broaden the array of services offered by [220] licensees and . . . thus benefit consumers." The 220 MHz service is already a cutting edge experiment in spectral efficiency. Exactly what services the public may need in the future are still largely unknown. Certainly as PCS and Cellular battle it out in the wireless telephony marketplace, and 800 and 900 MHz ESMR fight for their share of the enhanced digital mobile services, traditional, affordable mobile dispatch service will still be in demand at the low prices which 220 MHz licensees will be able to offer. Fixed or other mobile services in this band may become the economic salvation, the "icing on the cake" for those licensees offering plain vanilla dispatch at low monthly fees.

The 220 MHz service has already become a most successful experiment in spectral refarming. The early pioneers and those who follow them should have the flexibility to create the greatest possible variety of fixed and mobile services in response to the public need. Kelley thus also strongly supports the Commission's proposal to allow paging on a primary basis in the 220 MHz band for Phase I and Phase II licensees (Pg. 44, Para. 87). But even with the widest possible scope of permissible uses, licensees in the 220 MHz band remain spectral mice who will need as much regulatory flexibility and encouragement as possible to build a business in the land of the spectral elephants. This is especially true of those Phase I licensees like Kelley with one or two narrowband channels, and equally true for those with a single 5-channel authorization.

III

Finally, but most importantly, as an incumbent Phase I licensee of Channels 178 and 186, both of which will fall into the new "Regional" category that the Commission proposes to create, Kelley is more than a little wary of what the future holds. The Commission is careful to recognize that incumbent licensees need adequate interference protection (Pg. 50), but Kelley is concerned that the Commission does not realize that Phase I 220 MHz stations, operating at their authorized antenna height and power, now provide a 38 dBuV/m contour far beyond the Commission's originally expected 45 kilometers (28 miles). In this real world of greater signal coverage, Phase I licensees may not be afforded adequate protection from interference by new Phase II licensees.

The Commission's Rules, Section 90.723(f) provide for a 120 kilometer separation between co-channel 220 MHz stations, and the Commission is proposing that Phase II licensees in the 220 service ". . . ordinarily not be permitted to construct their stations less than 120 kilometers from constructed and operating Phase I, co-channel stations" (Pg. 50, Para. 99). In the same paragraph, however, the Commission proposes to allow Phase II licensees to put a co-channel station closer than 120 kilometers away from another station as long as it can demonstrate ". . . at least 10 dB protection to the 38 dBuV/m contour of the existing licensee's station" (Ibid).

If the Commission were to require that the true 38 dBuV/m contour of an existing station be determined in each case by real field-measurements, then a 10 dB protection to that measured contour might provide adequate protection for the existing licensee. For practical reasons, however, the Commission is proposing that a new station provide 10 dB protection only to the predicted 38 dBuV/m contour, i.e. 28 miles out from the base station, using "the F (50,50) field strength chart for Channels 7-13 in Section 73.699 of the Rules with a 9 dB correction factor for antenna height differential" (Pg. 49, Note 149). This will definitely not provide anywhere near adequate protection to existing licensees and their customers who are enjoying much wider area service now.

By way of a local example, Kelley's base stations are licensed at 60 watts ERP; the mobiles are permitted 40 watts. At their authorized power and antenna height 1,570 feet above sea level on the Blue Ridge mountain 40 miles west of Washington, D.C., these repeaters can communicate effortlessly with the mobiles up to 45 miles away from the tower in suburban and rural areas. The signal breaks up 42 miles away in downtown Washington because of the tall buildings, but it is still useable in many sections of D.C. outside of the immediate "downtown" area. If the Commission allows fixed use of these channels, even a 45 mile protection contour will be barely inadequate.

This kind of coverage is possible not only because of the authorized height of Kelley's base station antennas, but also because of the propagation characteristics of 220 MHz AM SSB which is far better than originally expected or hypothesized. If the Commission continues to greatly under estimate the excellent propagation characteristics of narrowband single sideband signals at 220 MHz, it will set the stage for a cacophony of interfering signals near the weak signal but still useable border area of every co-channel Phase I and Phase II station, seriously degrading overall service to the public.

By proposing to combine a mileage protection standard, which at 120 kilometers between co-channel stations is not quite adequate in the real world, with a signal strength protection standard, which at 28 miles to the 38 dBu contour (Pg. 49, Para. 98), is totally inadequate, the Commission is mixing apples and oranges that will cause immense difficulties for Phase I incumbents and Phase II auction winners alike. Because of the requests for relief that it will spawn, it will also slow service to the public.

Kelley respectfully reminds the Commission that in discussing upcoming auctions for unused MMDS spectrum (Second Order on Reconsideration in Gen. Docket 90-54), the Commission cites and reaffirms its own Technical Rules Order (98 FCC 2d at 105) when it says: "In view of the competitive bidding procedures we are adopting today . . . we have decided that it is even more important that an MDS station's protected service area boundary 'be easy to use and understand so that the spectrum use rights of licensees be clear' " (Page 6 Para. 11).

Elsewhere in that same document the Commission argues that: "Expanding protected service areas to more closely reflect actual service areas should strengthen the viability of authorized MDS stations by ensuring more of their customers are protected against harmful interference from other stations" (Pg. 5, Para. 9). At another point in its MDS Technical Rules Order, the Commission notes that "Unlike calculated and measured contours, a fixed mileage boundary is easy to use and understand (105-06)." Based on these and other observations, on June 15, 1995, the Commission a simple mileage-based protected service area for the MMDS service.

With the arrival of competitive bidding for unused spectrum in the 220 service, the need for "easy to use" protected mileage boundaries and the value of maintaining "the viability of incumbent licensees" is just as strong and just as important as in the MMDS. In fact, the Commission used mileage separation as the interference criterion in its original assignment of every Phase I 220 MHz license. The Commission should now simply adjust that distance from the original 120 kilomenters to 130 kilometers, with an additional correction factor of 5 or 10 kilometers for mountain top stations, to better reflect real world experience at 220 MHz.

Kelley thus respectfully suggests that the Commission follow its own example from the June 15, 1995 MMDS Order and simplify protection for 220 MHz incumbents and Phase II licensees alike by reaffirming a simple mileage separation between all co-channel stations. Further, Kelley respectfully requests that the Commission recognize and accept the observations of existing licensees that narrowband AM SSB propagates far better than wideband NTSC TV at the same frequency, and adopt a co-channel mileage separation of a more realistic 130 kilometers (producing a useable service contour of 40 miles), with an additional correction factor of 5 to 10 kilometers for mountain top stations. Co-channel Phase I stations that have been built conforming to a 120 kilometer separation (and there may not even be any at this time) should be grandfathered. All new Phase I and II stations should provide incumbents the higher mileage protection.

CONCLUSION

In summary, Kelley strongly supports the Commission in relaxing rules restricting certain channels to data only, supports fixed or mobile and pagaing uses of these channels to provide the widest variety of service to the public, and respectfully requests that the Commission not employ chart-based signal strength interference contours to protect incumbents. Instead the Commission should follow its own example in the MMDS Second Order and affirm a simple mileage criterion for protection of all licensees against co-channel interference. The Commission should raise the mileage separation it used in Phase I licensing from 120 to a more realistic 130 kilometers in light of the experience of existing 220 licensees and their customers now on the air. This will provide Phase II licensees with understandable and clear boundaries they need to protect, and will help strengthen the viability of incumbent Phase I licensees as they enter the Phase II world of regional licensees. Rare, existing Phase I co-channel licensees strictly conforming to a 120 km separation should be grandfathered.

Respectfully submitted,

Michael R. Kelley, Ph.D.
d/b/a/ Shannondale Wireless
3623 Parklane Road
Fairfax, Virginia, 22030
(703) 691-1119